CHAPTER 8: DRUM SECTION

CONTENTS

1. Theory of Operation
1. Master on Drum (in printing) Check Mechanism 8-1
2. Drum Set Check Mechanism 8-2
3. Ink Cartridge Set Check Mechanism 8-3
4. Ink Cartridge Setting Mechanism 8-4
5. Drum inserting Block Pin Mechanism 8-5
6. Ink Supply Mechanism 8-6
7. Drum Idling Mechanism 8-8
8. Squeegee Roller Rotation Mechanism 8-10

2. Removal and Assembly
1. Screen 8-11
2. Drum Body 8-12
3. Ink sensor PCB 8-14
4. Cartridge holder and Cartridge set SW cover 8-15
5. Cartridge set SW PCB 8-15
6. Cartridge holder base 8-16
7. Squeegee Roller 8-17
8. Drum Support F & Drum Support R 8-19
9. Ink Pump Unit 8-22
10. Inking Motor 8-23
11. Slider Link 8-24
12. Cartridge set lever unit 8-25

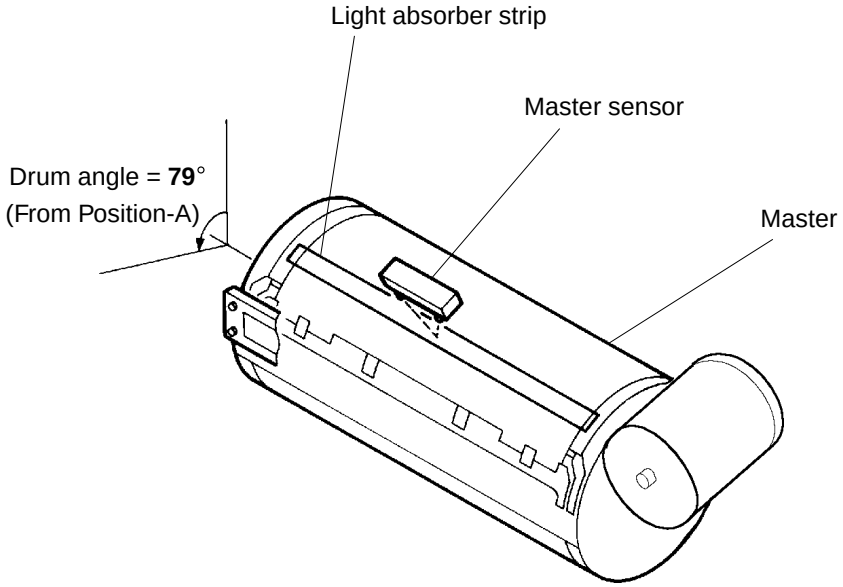
3. Adjustment
1. Squeegee Gap 8-26
2. Squeegee Pressure Balance 8-27
3. Ink Blocking Plate Position 8-28

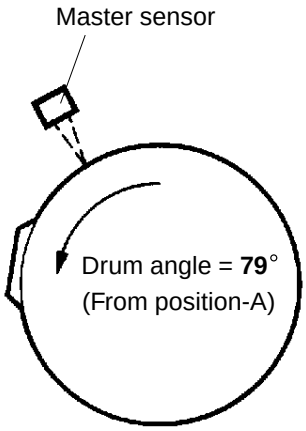
1. Theory of Operation

1. Master on Drum (in printing) Check Mechanism

1. Master Sensor

> Master Sensor checks the presence of master on the Drum before the start of printing.
> 79° Drum rotation after the first Position-A, the Master Sensor looks for the master on the Drum.
> The result (whether the master is found or not) is memorized until the Drum is pulled out of the machine or the power is turned off.
> If no master is detected on the Drum, **[C27]** is indicated on the Operation panel and stops the printing operation.

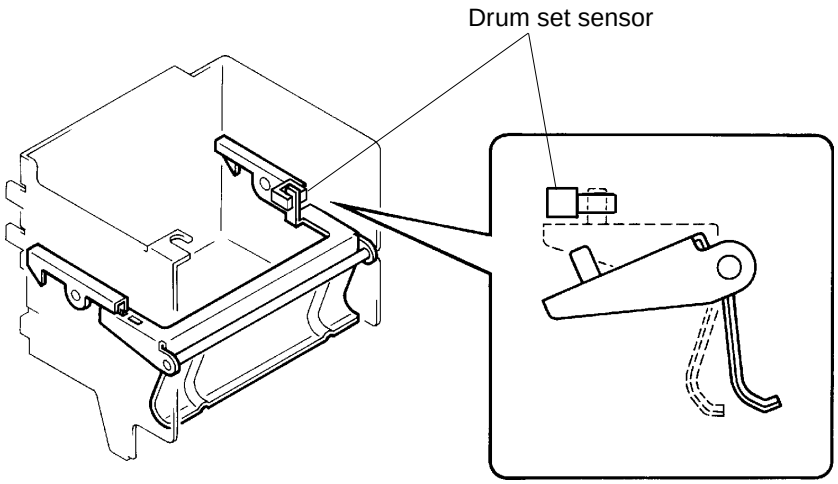




2. Drum Set Check Mechanism

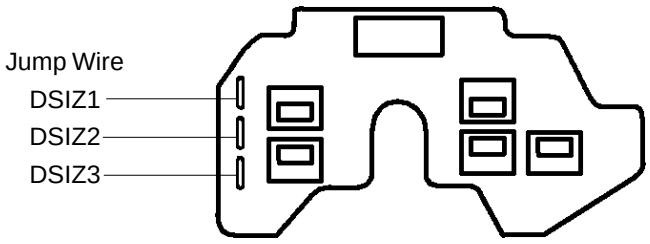
1. Drum Set Sensor

> Drum set sensor checks the presence of the Drum in the machine.



2. Drum Size/ Color Setting

> Drum Size/ Color has to be set on each drum.
> Drum Size/ Color has to be set on the Cartridge Set SW PCB.
> Depending on the cutting combination of the jump wires, as shown on below figure, the Drum Size/ Color can be set.
Setting of the Drum Size/ Color is shown on below table.



Drum Size/ Color Setting (Cartridge Set SW PCB)

	B4/ Black	B4/ Color	A4/ Black	A4/ Color	Legal/ Black	Legal/ Color
DSIZ1	——	——	Cut	Cut	——	——
DSIZ2	——	——	——	——	Cut	Cut
DSIZ3	——	Cut	——	Cut	——	Cut

3. Ink Cartridge Set Check Mechanism

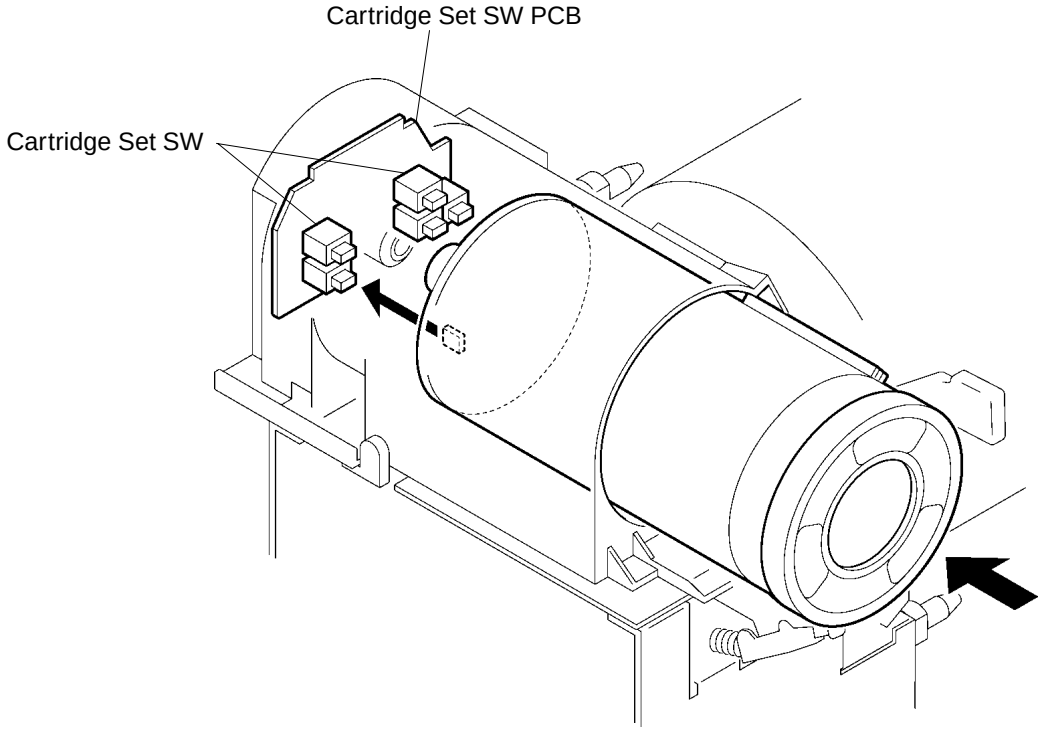
1. Ink Cartridge Set SW

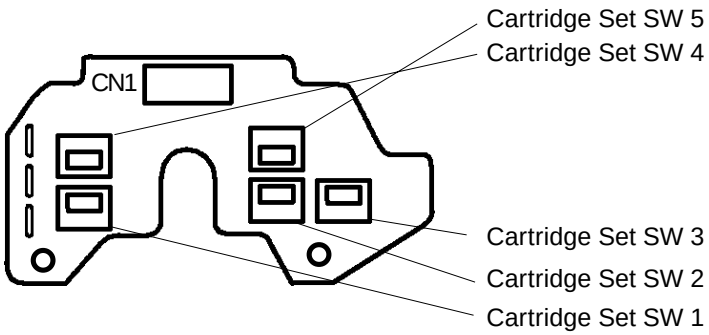
> Ink Cartridge set SW checks the presence of the Ink Cartridge in the Ink Cartridge holder.
> There are five switches on Cartridge set SW PCB as shown on below figure.
> The machine will judge by the combination of these detecting Set Switches, whether the color ink or the right type of black ink cartirdge are installed.
Depending on the region of the user, deferent type of CR Black ink will be distributed.

[Ink Cartridge type]

- ▶ CR Color Ink
- ▶ CR Black Ink 'type U' --------- U. S. region
- ▶ CR Black Ink 'type E' --------- Europe region
- ▶ CR Black Ink 'type C' --------- China region
- ▶ CR Black Ink 'type A' --------- Asia region

If the deferent Ink Cartridge type is installed, the machine will indecate "Set Ink Cartrige in Place"(Advice display No. 'C53').





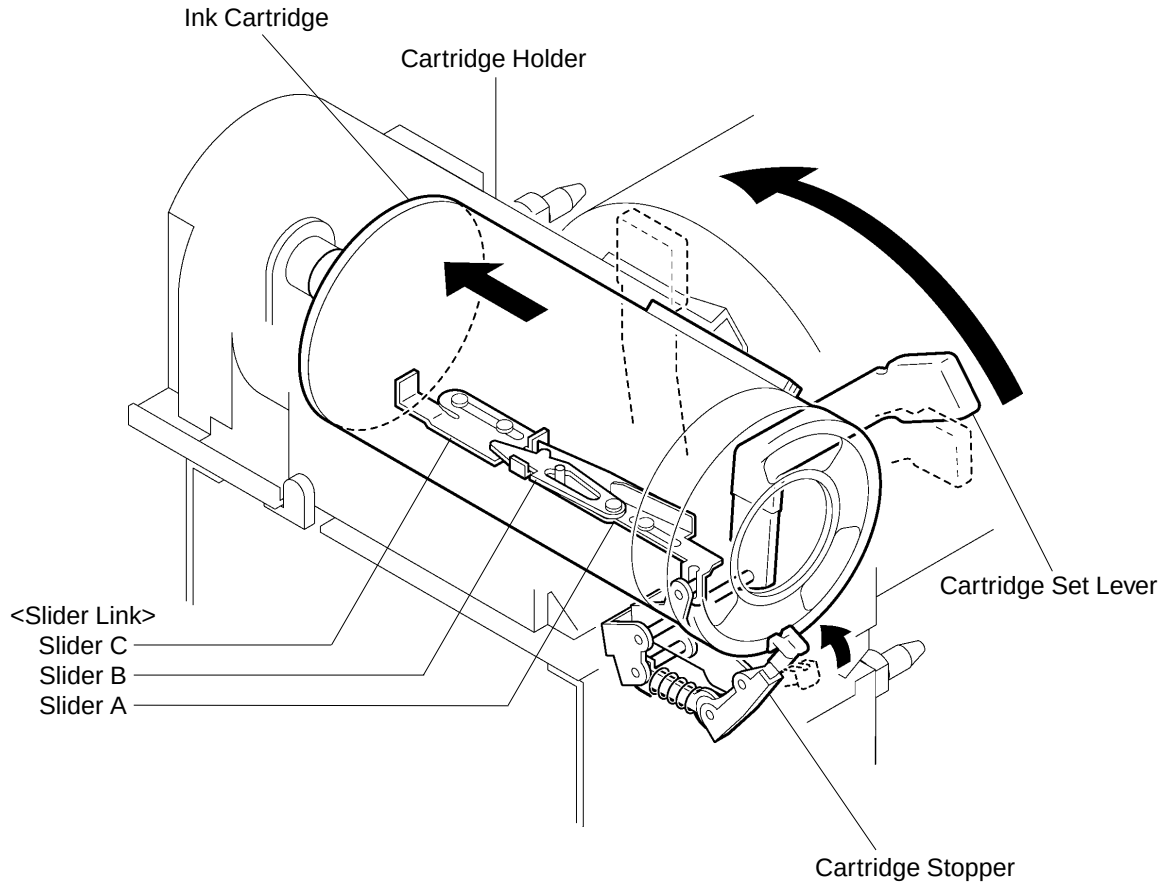
4. Ink Cartridge Setting Mechanism

1. Ink Cartridge Setting

When the Cartridge set lever is turned to the lock positon, the Ink Cartridge is pushed into the Cartridge holder by the Cartridge stopper arm and automatically set in the holder.

2. Ink Cartridge Releasing

When the Cartridge set lever is turned to the releasing position, the Slider Links slides, and the hook of the Slider C pulls the Ink Cartrige out from the Ink nozzle. The user then can easily replace the Ink Cartridge.

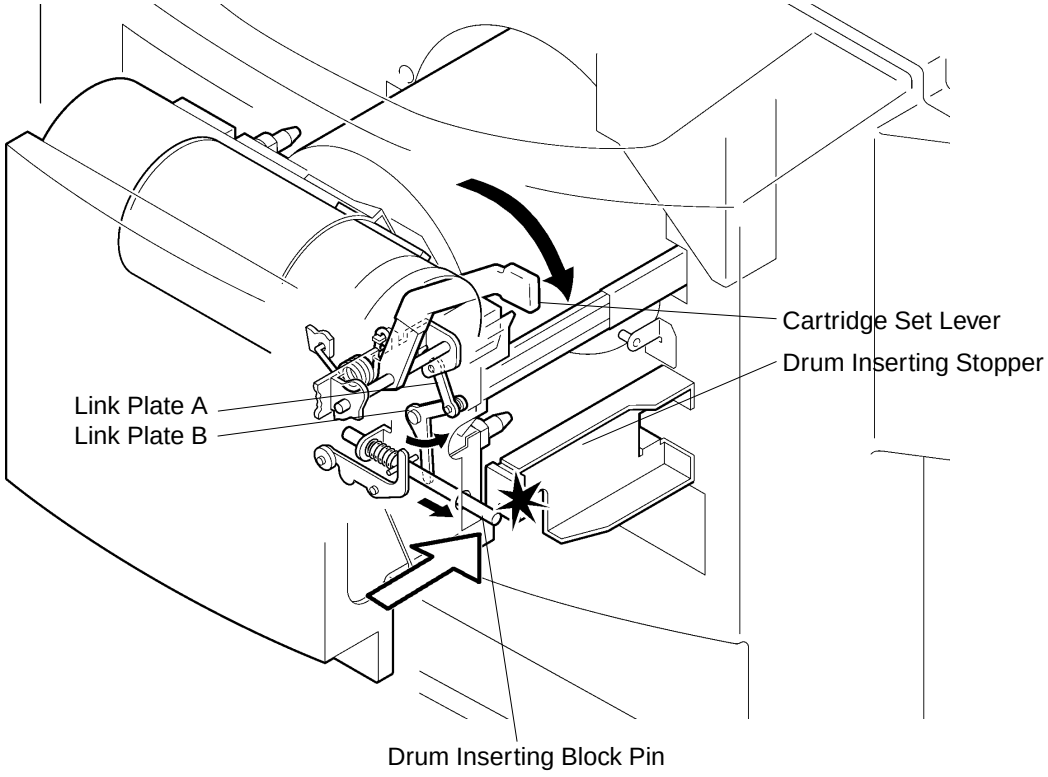


5. Drum inserting Block Pin Mechanism

1. Prevention of the Drum inserting without locking the Ink Cartridge

When the User tris to insert the Drum without locking the Ink Cartridge (with the Cartridge set lever at the releasing position), the Drum inserting block pin will prevent from inserting the Drum.

When the Cartridge set lever is turned to the releaseing position, the Drum inserting block pin will stick out from the frame as shown on below figure, and the block pin will hit against the Drum inserting stopper.
When the Cartridge set lever is flipped to the lock position, the block pin is pulled back inside the frame.



6. Ink Supply Mechanism

1. Ink Sensor PCB

> Ink sensor on the Ink sensor PCB checks the presence of ink in the Drum.
> Overflow sensor checks the ink overflow in the Drum.

2. Inking Motor

> Inking motor activates the Ink pump to supply the ink into the Drum when ink is not detected by the Ink sensor.
> Ink from the Ink Cartridge is pumped through a hose into the Drum, on top of the Squeegee roller, through Ink distributor.
> The Inking motor stops when the Ink sensor detects ink.

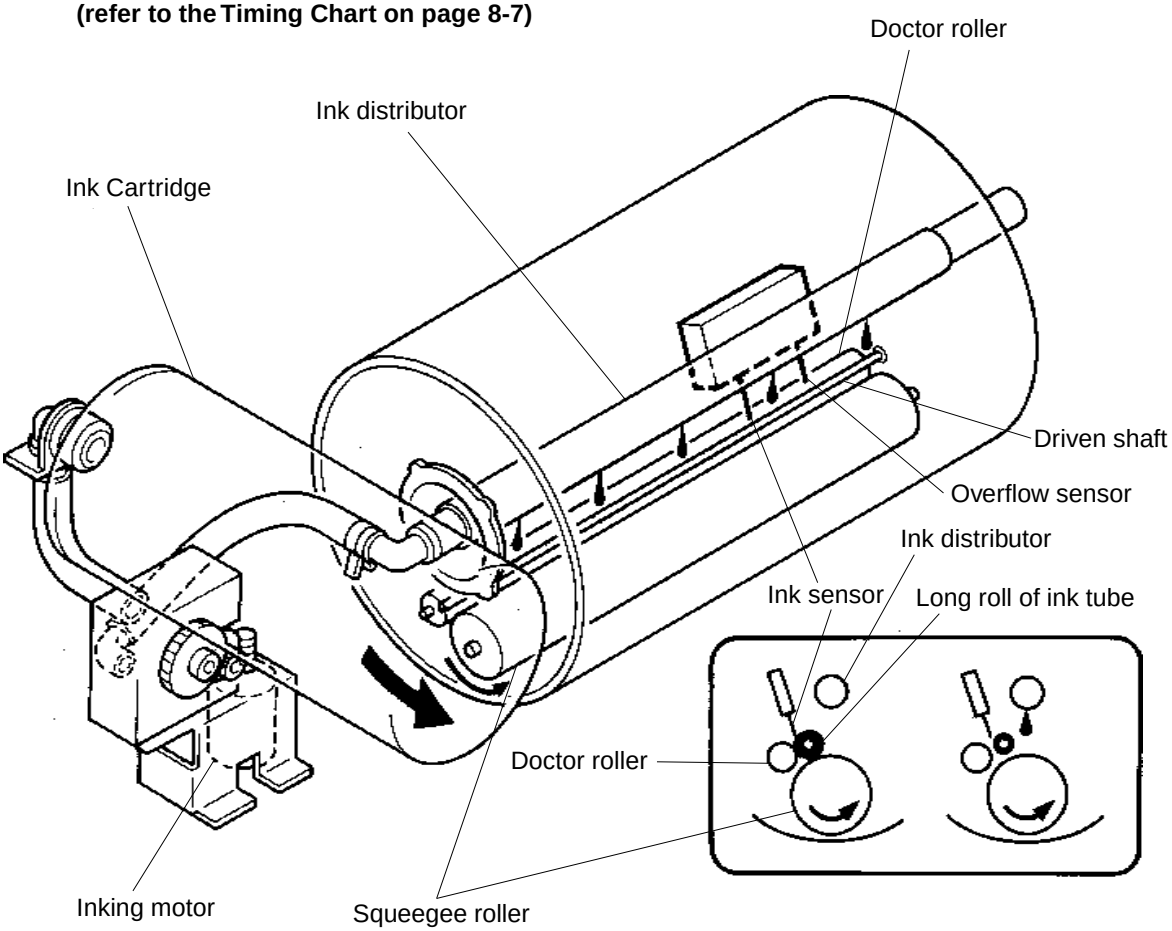
3. Ink Supply to the Inner Surface of the Drum

> The ink supplied on the Squeegee roller is transferred onto the Drum inner surface by the rotation of both the Squeegee roller and Drum.
> Excess ink is then made into a long roll of ink tube around a thin Driven shaft located between the Squeegee roller and Doctor roller, and this excess roll of ink tube is checked by the Ink sensor and Overflow sensor.

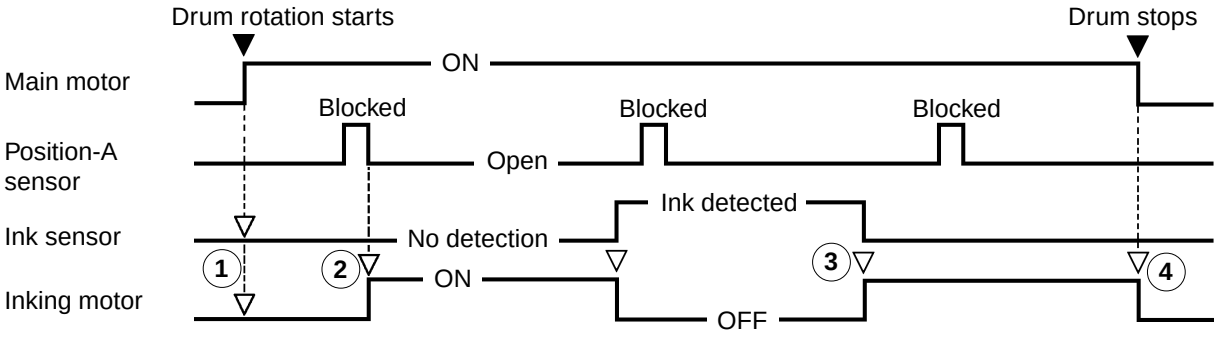
4. Ink Overflow

> If an excess amount of ink is supplied in the Drum and Overflow sensor detects the ink, the machine stops with **[E04]** indication on the Operation panel.

(refer to the Timing Chart on page 8-7)



Inking Timing Chart



① The Inking motor does not activate at the start of Main motor even though the Ink sensor is not detecting the ink.

② The Inking motor activates when the light path of the Position-A sensor changes from "blocked" to "open" with the rotation of the Drum if the Ink sensor is not detecting the ink.

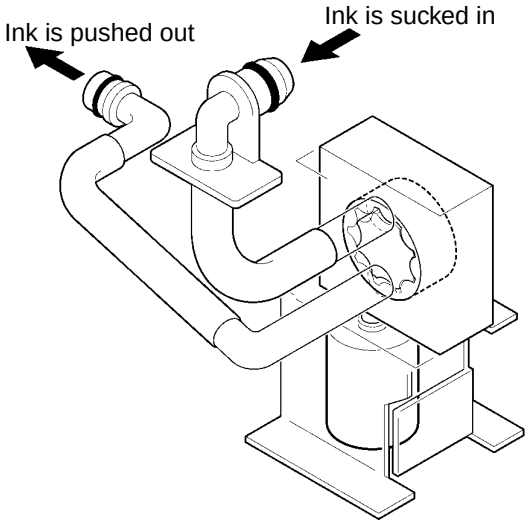
③ The Inking motor activates when the Ink sensor no longer detects the ink during printing.

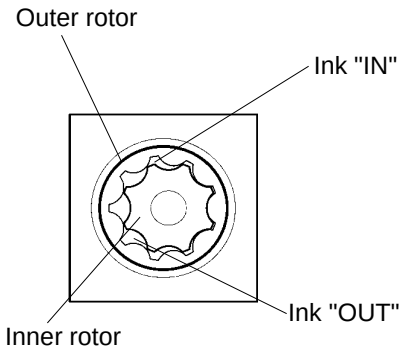
④ The Inking motor turns off when the Main motor is turned off.

> If Ink sensor does not detect ink within **20 seconds** after the Inking motor is activated, the machine assumes that the Ink Cartridge is empty and **"Replace Ink Cartridge"** LED on Operation Panel is lit. If the machine power is turned OFF before the 20 second count, the counting continues from that point when the machine is turned ON again.

> If Overflow sensor detects ink for more than 0.5 seconds, the machine assumes that the ink has over flown within the Drum and displays error message **[E 04]**.

> If excess current is detected for more than 0.3 seconds after the Inking motor is activated, the machine assumes that the Inking motor has locked and indicates error message **[E 16]**.





The ink sucked in is carried between the Outer and Inner rotors of the Ink pump and as the gap between the rotors becomes small, the ink is pushed out.

7. Drum Idling Mechanism

1. Drum Idling

During printing, if the Ink sensor does not detect ink, the Inking motor activates to pump the ink from the ink cartridge into the Drum.
But if the Ink sensor does not detect the ink within 15 seconds after the Inking motor activates, the Drum goes into idling.

2. Paper feed stops during the Drum Idling movement

When the Drum idling starts, the paper feed stops and a group of dots ▬ ▬ ▬ ▬ rotates within the Display window of the Operation panel to indicate that the Drum idling mode is in progress.
The machine returns to normal operating condition when the Ink sensor detects the ink.

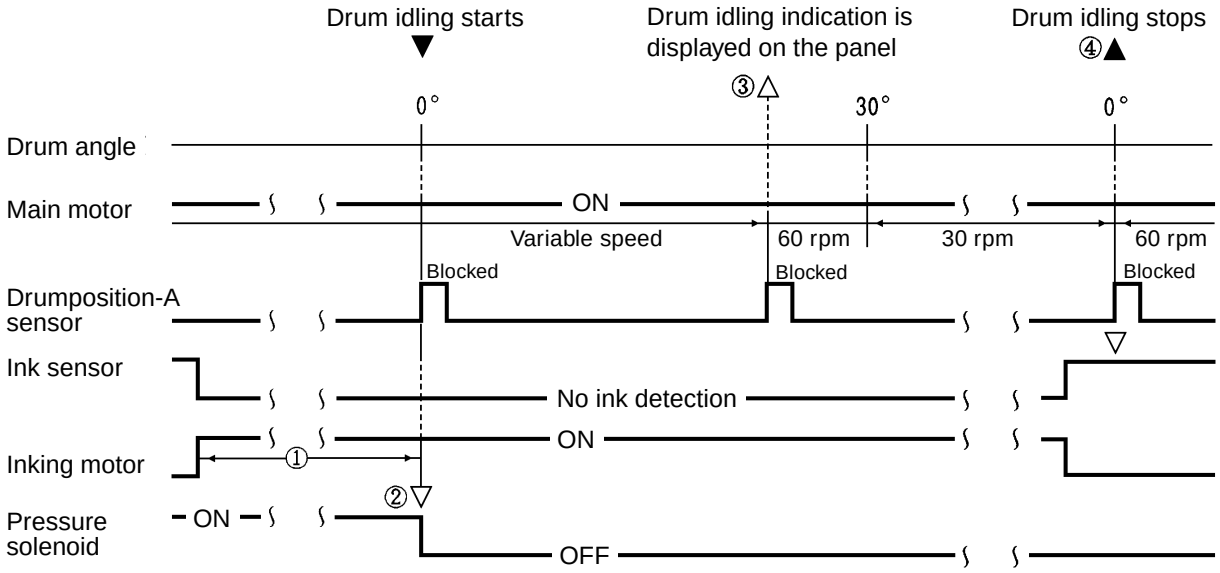
3. The condition for the Drum Idling to take place

The Drum idling takes place if the total of inkless time adds to less than 60 seconds and machine meets one of the following three conditions.

a. First machine operation after the power is connected to the machine.
b. First machine operation after pulling out and returning the Drum back into the machine.
c. First machine operation after machine was left idle for more than 24 hours.

(refer to the Timing Chart on page 8-9)

Drum Idling Timing Chart



① If the Ink sensor does not detect any ink within **15 seconds** after the Inking motor is activated, the machine goes into Drum idling from next Drum position-A.
But if the Ink sensor detects the ink before the Drum comes to position A, the Drum idling movement is cancelled, and the printing starts.

② The Drum idling movement starts from the Drum position-A, which is equal to Drum at 0°, and deactivates the Pressure solenoid.

③ At the second Drum position-A, the Panel on the machine indicates the Drum idling display.

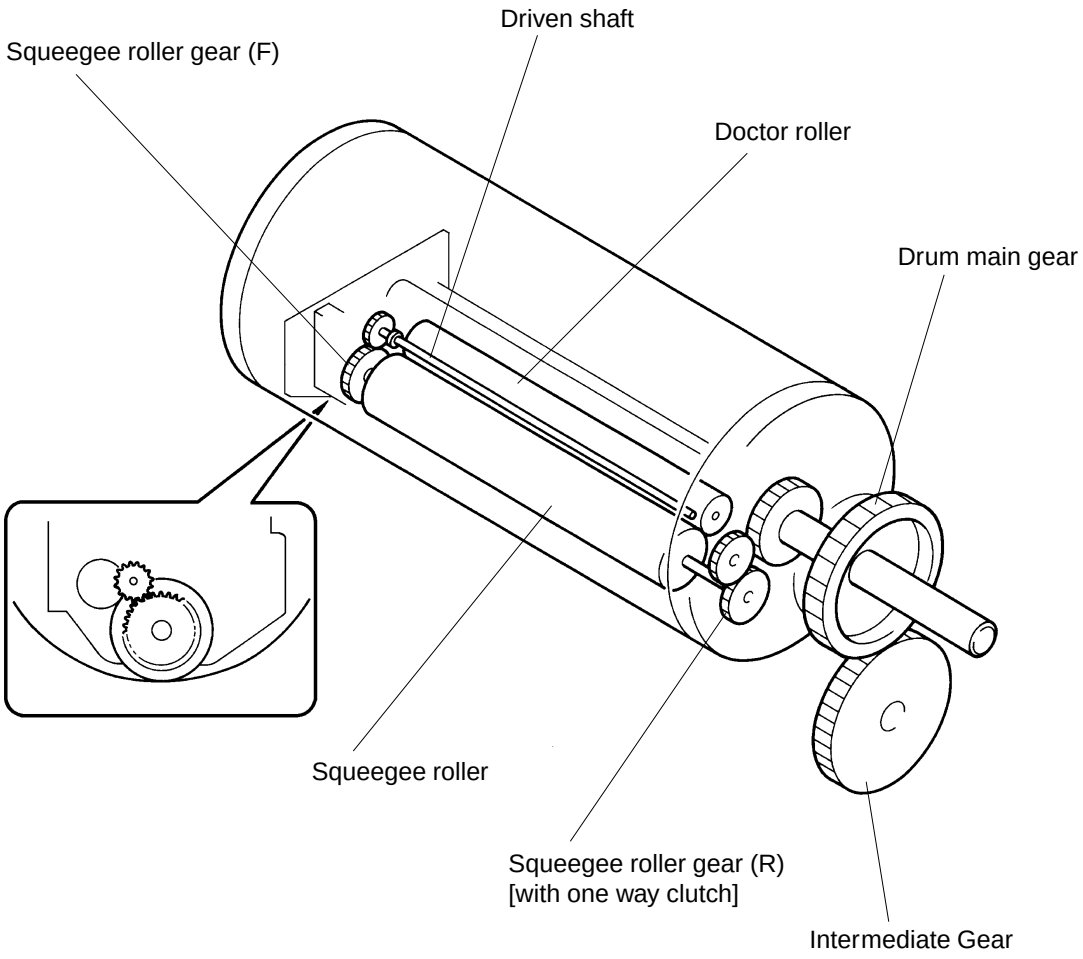
④ During the Drum idling movement, the Ink sensor is checked at every Drum position-A for any ink detection.
If ink is detected, the Drum idling movement ends and the printing starts.

- If the Ink sensor does not detect any ink within **80 seconds** after the Drum idling started, the machine assumes that the Ink Cartridge is empty and lights the **"Replace Ink Cartridge"** LED on the panel and indicates the message **[C 41]** on the display.

8. Squeegee Roller Rotation Mechanism

1. Rotation of the Squeegee Roller

Through the gears, the drive of the main motor is transferred to the Squeegee roller gear (R) and rotates the Squeegee roller.
The Squeegee roller gear (R) has one way clutch which prevents the Squeegee roller from rotating when the Drum is accidentally rotated in the opposite way by hand.

2. Rotation of the Driven Shaft

With the rotation of the Squeegee roller, the Squeegee roller gear (F) transfers the rotation to the gear on the Driven shaft and rotates the shaft.